

CLAIMS

1. A black ink for inkjet recording, which comprises:
an aqueous medium; and

a dye having a λ_{max} of from 500 nm to 700 nm and a half-band width of 100 nm or more in an absorption spectrum of a diluted solution, the absorption spectrum being standardized to have an absorbance of 1.0 at the λ_{max} ,

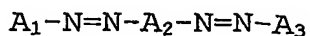
wherein a change ratio of an absorbance at λ_{max} in a visible region is 10 % or less before and after the black ink is heated to reflux for 6 hours under a condition which water boils, wherein the absorbance is an absorbance of the black ink in a cell having an optical path length of 5 μm .

2. The black ink for inkjet recording according to claim 1, which further comprises a dye having a λ_{max} of from 350 nm to 500 nm.

3. The black ink for inkjet recording according to claim 1 or 2, wherein at least one dye to be contained in the black ink has an oxidation potential higher than 1.0 V versus SCE.

4. The black ink for inkjet recording according to any one of claims 1 to 3, wherein the at least one dye to be

contained in the black ink is a dye represented by formula (1):



wherein A_1 , A_2 and A_3 each independently represents an aromatic group or a heterocyclic group that may be substituted; A_1 and A_3 each represents a monovalent group; and A_2 represents a divalent group.

5. The black ink for inkjet recording according to any one of claims 1 to 4, wherein the aqueous medium comprises a water-soluble organic solvent having a boiling point of 150 °C or higher.

6. The black ink for inkjet recording according to any one of claims 1 to 5, wherein the black ink has a content of an amide solvent of 5 % or less by weight.

7. The black ink for inkjet recording according to any one of claims 1 to 6, wherein the black ink has a pH of from 6 to 9.

8. An ink set for inkjet recording, which comprises at least two black inks having different densities from each other, wherein the at least two black inks each independently comprises: an aqueous medium; and a dye having a λ_{\max} of from 500 nm to 700 nm and a half-band value of 100 nm or more in

an absorption spectrum of a diluted solution, the absorption spectrum being standardized to have an absorbance of 1.0 at the λ_{\max} ,

wherein

a lower density black ink in the at least two black inks has an ozone fastness stronger than that of a higher density black ink in the at least two black ink, the higher density black ink having a density higher than that of the lower density black ink.

9. An ink set for inkjet recording, which comprises at least two black inks having different densities from each other, wherein the at least two black inks each independently comprises: an aqueous medium; and a dye having a λ_{\max} of from 500 nm to 700 nm and a half-band value of 100 nm or more in an absorption spectrum of a diluted solution, the absorption spectrum being standardized to have an absorbance of 1.0 at the λ_{\max} ,

wherein

the at least two black inks satisfy following relationship:

$$Z = (RD-L) / (RD-H) < 1$$

wherein RD-L represents a ratio of D_{\max} (A) to D_{\max} (B) of a lower density black ink in the at least two black inks;

RD-H represents a ratio of D_{\max} (A) to D_{\max} (B) of a higher

density black ink in the at least two black inks, the higher density black ink having a density higher than that of the lower density black ink;

D_{max} (A) represents an absorbance at λ_{max} in a visible region in measuring the absorbance of the lower density black ink or the higher density black ink in a cell having an optical path length of 5 μm ; and

D_{max} (B) represents the absorbance at λ_{max} in the visible region in measuring the absorbance of the lower density black ink or the higher density black ink diluted with water by 2,000 times in a cell having an optical path length of 1 cm.

10. An ink set for inkjet recording, which comprises at least two black inks having different densities from each other, wherein the at least two black inks each independently comprises: an aqueous medium; and a dye having a λ_{max} of from 500 nm to 700 nm and a half-band value of 100 nm or more in an absorption spectrum of a diluted solution, the absorption spectrum being standardized to have an absorbance of 1.0 at the λ_{max} ,

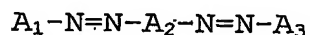
wherein

when with respect to each of the at least two black inks, a stepwise printing sample having a concentration pattern of 15 steps up to 30 mL/m² at maximum is prepared and a reflection density in the concentration pattern is measured, a higher

density black ink in the at least two black inks has a maximum value of the reflection density higher than that a lower density black ink in the at least two black ink, the lower density black ink having a density lower than that of the higher density black ink.

11. The ink set for inkjet recording according to any one of claims 8 to 10, wherein at least one dye to be contained in the at least two black inks has an oxidation potential higher than 1.0 V versus SCE.

12. The ink set for inkjet recording according to any one of claims 8 to 11, wherein at least one dye to be contained in the at least two black inks is a dye represented by formula (1):



wherein A_1 , A_2 and A_3 each independently represents an aromatic group or a heterocyclic group that may be substituted; A_1 and A_3 each represents a monovalent group; and A_2 represents a divalent group.

13. The ink set for inkjet recording according to any one of claims 8 to 10, wherein at least one of the at least two black inks is a black ink according to any one of claims 1 to 7.